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PHOTOGRAPHIC INTELLIGENCE MEMORANDUM

KUIBYSHEV- MOSCOW

400 KV TRANSMISSION LINE

CIA/RR-HTA-MII-56

21 DECEMBER 1956

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CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

[redacted] SECRET-[redacted]

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KUIBYSHEV-MOSCOW

400 KV TRANSMISSION LINE

The Kuibyshev-Moscow 400 kv transmission line is approximately 560 miles long, the longest of its kind in the world. Designed to deliver 6.1 billion kwh of energy annually from the Kuibyshev hydro-electric plant to Moscow, the line constitutes an important link in the power system that serves the European part of the USSR. It is also the first 400 kv system in the USSR.

Collateral material reports that construction of the transmission line began in April 1952, and that it was completed and put into operation in May 1956. It is a double-circuit line carried by two parallel rows of towers, with each circuit carrying half the full capacity of the line.

Three switching stations divide the line into four sections. These stations are reported to be constructed along the route of the transmission line at Ulyanovsk, Arzamas, and at Vladimir. The line terminates in the vicinity of Moscow in two substations: one near Noginsk (55°50'N-38°28'E), the second in Beskudnikovo (55°53'N-37°34'E). As the power line consists of two separate circuits, the southern and the northern, each substation serves one of these circuits. The south circuit of the line is connected to the 400 kv East Substation at Noginsk while the north circuit continues to the 400 kv North Substation at Beskudnikovo, 35 miles west of Noginsk.

The accompanying map shows 110 miles of the 560-mile Kuibyshev-Moscow 400 kv transmission line, covered by and confirmed by [redacted] 25X1D

25X1D [redacted] photography. This includes 50 miles of the line southeast of Vladimir covered by oblique photography which allows only an approximate location. Heavy cloud cover prevents continuous location of the Moscow-end of the line.

The two parallel circuits which form this transmission line are first discernible on the photography east of Moscow near the town of Pavloskiy Posad, and approximately 11 miles east of the substation near Noginsk. From here the two circuits continue in a ENE direction to the small village of Rukav, located 7.5 miles southwest of Vladimir. At 25X1D Rukav the lines lead into a large switching station which on [redacted] photography appears to be under construction. From this station the two circuits are discernible on oblique photography only, and continue in a general southeasterly direction for about 50 miles where all photographic coverage of the transmission line ends. The line is reported to cross the Oka River in the vicinity of Murom.

The spacing of the towers in each of the two parallel circuits ranges from 1300' to 1500' except in the case of a major terrain feature such as a large river or hill. The clearing in wooded areas is approximately 200' wide for each circuit. The two parallel clearings are about 465' apart.

Each tower appears to consist of two, narrow, tapered, steel lattice masts supporting at the top a lattice cross-arm from which are suspended the insulators and individual power conductors. Height of the towers as determined from aerial photography is [redacted] The width of the cross-arm

 25X1D

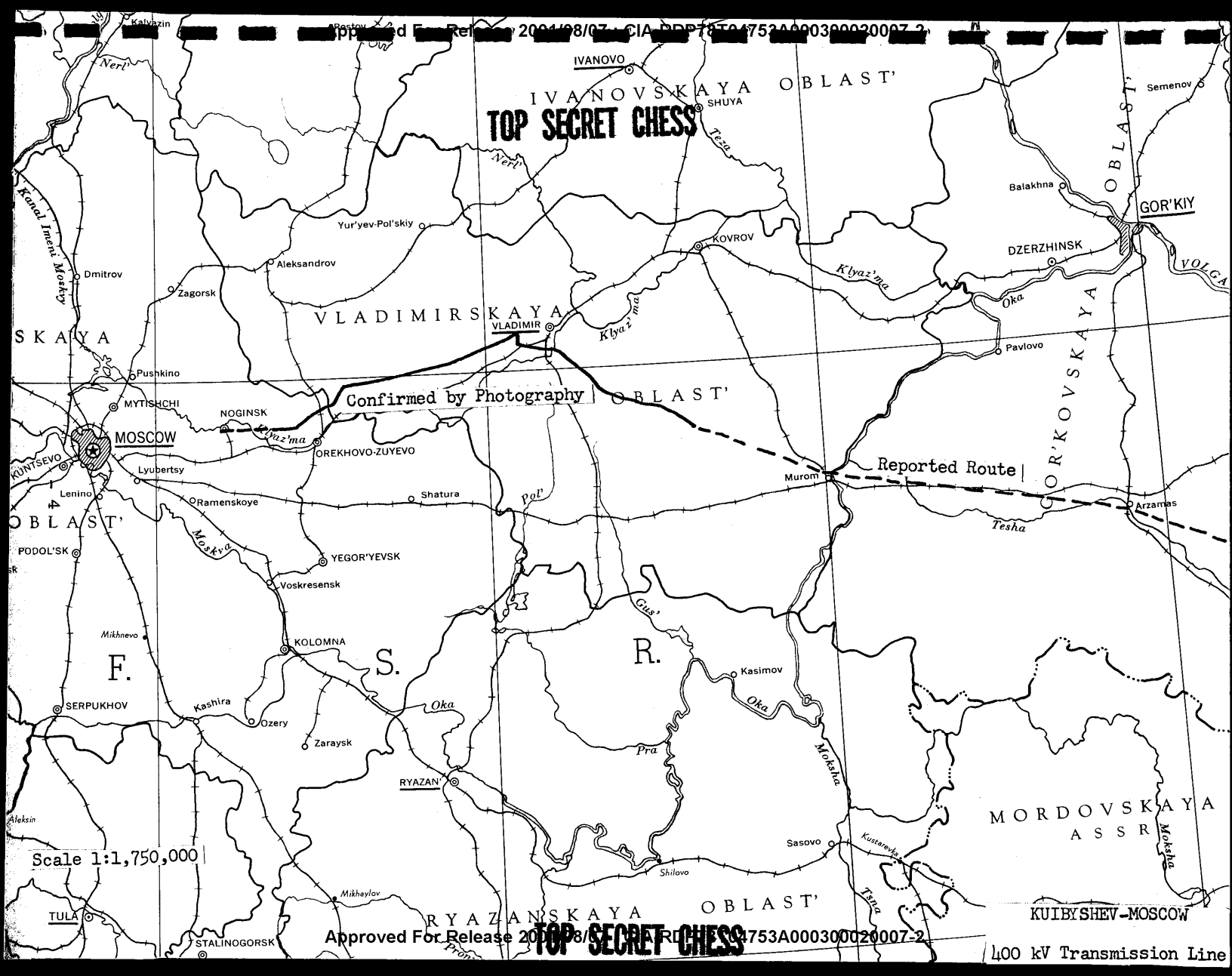
25X1D

at the top, the widest part of a tower, is approximately [redacted] The spacing between the two masts of a tower is [redacted] 25X1D

On some of the photography, the towers appear to be supporting three large lines. This tends to substantiate reports that each transmission circuit is a three-phase line and that each phase of the line contains three conductors located at the apexes of an equilateral triangle. In this way, nine conductors are suspended from each tower. Each group of three conductors appears as one large line on the photography because of the scale. The line is reported to be protected against direct lightning strokes by two steel ground wires running along the tops of the towers for the entire length of each circuit.

Due to the small scale of the photography the insulation configuration is not evident. However, collateral material reports that the insulators are a porcelain suspended type consisting of 22 units per suspension string. The total length of the suspension string assembly is reported to be [redacted]

25X1D



REQUIREMENT: Prepared in answer to RR/HTA/E/R114/56 requesting description and location of the Kuibyshev-Moscow 400 kv transmission line.

25X1D

PHOTO DATA:

[redacted]